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Developing a Framework for Evaluating Benefits of Information Technology Projects in Local Communities

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Abstract: Governments of the developing world - including South Africa - have a strong commitment and resolve to accelerate the rollout of Information and Communication Technology (ICT) to the benefit of communities. Both government and the private sector are delivering a number of ICT-based interventions in South Africa. These are in an effort to meet the country's commitments to targets agreed to at the World Summit on Information Society (WSIS) in 2003. It has been found that ICT for Development (ICT4D) initiatives have not been as sustainable as expected. Hard evidence about the economic and social impact from the development of ICT4D is also lacking. Similarly, evidence of evaluation of benefits of these ICT4D projects worldwide is scarce and anecdotal and the knowledge of benefits or impacts from ICT initiatives is still incomplete. One possible reason for this is that there are no established evaluation frameworks. Nor are there clear guidelines as to how to identify suitable indicators or how to develop metrics to evaluate these indicators. Thus the question of how to conduct appropriate evaluation is an important one in the ICT4D landscape. This paper suggests a research design for the development of an evaluation framework and of guidelines for the implementation of the framework. Evaluation theories and frameworks currently used in the ICT4D discipline, which are rooted in multiple disciplines, are presented and their strengths and weaknesses in the application of developmental projects are discussed. A mixed method design within case studies of two telecentres in the Western Cape is proposed. The research will include a future longitudinal design within the two case studies, a survey conducted amongst stakeholders at the end of the data collection period, the implementation of the framework at a third telecentre and the development of guidelines for the implementation of the evaluation framework.

Keywords: Evaluation framework, ICT4D, community informatics, telecentre

1. Introduction

In the past fifteen years, massive strides have been made in harnessing the benefits of the Internet for commerce and industry. However, large sectors of society remain oblivious of the benefits of modern Information and Communication Technology (ICT). According to Rothenberg-Alami and Pal (2005: 2) in 2004 more than 80% of the world's population did not have access to ICT. In South Africa the uptake of the Internet is still at unacceptably low levels with a mere 10.75% Internet subscriber rate in 2007 (ITU, 2007).

Nationally and internationally researchers and policy makers have long reached consensus regarding the role of ICT in developing disenfranchised communities (WorldBank, 2009; Baliamoune-Lutz, 2003; Castells, 1999; Erwin and Taylor, 2004) . Governments of the developing world are therefore demonstrating a strong commitment and resolve to address this divide. They are investing large sums of money to accelerate ICT infrastructure rollout as well as in programmes to catalyse uptake and usage thereof. In South Africa a number of ICT-based interventions are being deployed by government and the private sector in an effort to meet this country's commitments to targets agreed to at the World Summit on Information Society (WSIS, 2003).

In parallel with the rollout of ICT developmental (ICT4D) projects, best practice in programme implementation and management demand that these projects are evaluated to determine whether the goals of developing and benefiting communities socio-economically, and otherwise, have been met. The importance of rigorous evaluation practice has been in the spotlight recently, especially since questions have been raised regarding the value delivered by ICT projects in the development arena. Heeks (2005), for example, suggests that these projects fail more often than not. Van Rensburg, Veldsman and Jenkins (2008: 179) point out that "the relatively simplistic views of the 'enabling powers' of ICT in the development arena has failed to deliver on the promised development goals, whether Millennium Development Goals (MDG) or otherwise" (UNESCO, 2002).

However, there is little evidence in the literature of research in respect of evaluation of benefits of ICT4D projects, both locally and internationally. There are still gaps in the knowledge of benefits or impacts of ICT initiatives Grunfeld (2007: 7).

Rothenberg-Alami and Pal (2005: 3) cite Keniston, the director of Massachusetts Institute of Technology (MIT) India, who stated that almost nothing is known of factors of effectiveness or ineffectiveness of ICT projects in developing nations. Others, such as Colle (2005: 6) support this assertion by pointing out that there is only scant and anecdotal evidence that community-based ICT projects are benefiting communities

Thus although a clear rationale has been established for evaluation in the ICT4D arena, there are no clear frameworks and guidelines to inform this complex process. There are still no satisfactory theoretical bases that can inform practical ways to determine whether communities (individually and collectively) have developed socio-economically by the means of ICT4D projects. Thus the question of how to conduct appropriate evaluation is important and topical in the ICT4D landscape. This paper is an initial response to this void. We firstly provide an overview of relevant evaluation methods and paradigms. Thereafter we propose a research method to develop a framework for evaluation of ICT4D projects and for the establishing of guidelines for the implementation of such a framework.

2. Literature review

A preliminary review of literature has shown that frameworks for ICT4D projects' evaluations are rooted in theories from multiple disciplines, including economics and information technology (Grunfeld, 2007: 3). Evaluation methods from other domains include Amartya Sen's 'capability approach' (Alampay, 2006; Gigler, 2004; Grunfeld, 2007: 4; Sen, 1999) and Hickey and Mohan's participatory monitoring and evaluation approach (Grunfeld, 2007: 3). The business and the education sectors are the main domains from which frameworks are taken (Baron and Bruillard, 2003; Milis and Mercken, 2004).

2.1 ICT evaluation: business and education

Since, historically the evaluation of IT benefits has mainly taken place in the business and education sectors, the research literature on the evaluation of ICT focussed on evaluating ICT in business and organisational sectors (DeLone and McLean, 1992; Seddon, Staples, Patnayakuni and Bowtell, 1999). For the past four decades the problem of evaluating the benefits of ICT has been at the fore of business research e.g. Boyd and Carson (1963), Gallagher (1974) and Lucas (1973).

For example, in the business sector IT evaluation consisted of two areas, namely:

- Evaluation of IT efficiency or success, involving concepts such as information quality or user satisfaction. (Seddon et al., 1999; DeLone and McLean, 2002)
- Evaluation of IT benefits involving, for example, financial benefits or non-financial benefits to organisations (Milis and Mercken, 2004)

The increased complexity of ICT, the uncertainty and unpredictability associated with benefits and costs are among the challenges to businesses presented by the implementation and management of ICT (Joshi and Pant, 2002). These challenges pointed researchers to the development of methods to evaluate the impact of their ICT investment (Irani, Love and Zairi, 2000). Over the past twenty years researchers were greatly interested in the question of ICT effectiveness and its evaluation, starting with Boyd and Carson (1963), Gallagher (1974) and Lucas (1973).

Researchers have employed a number of methods in their search to determine the effectiveness of ICT. These methods include simple accounting measures to multi-dimensional Balanced Score-Card type metrics. For example, DeLone and McLean (1992) described a model for information success which was developed into an IS Effectiveness Matrix by Seddon *et al*. (1999). The technology acceptance model (TAM) has also been modified in a number of ways by researchers in the evaluation of ICT4D projects (Grunfeld, 2007: 7). The question whether these evaluation methods are suitable in an ICT4D context, according to the pertinent literature, is not yet answered.

In the education sector Wagner, Day, James, Kozma, Miller and Unwin (2005) compiled a handbook for monitoring and evaluation of Information and Communication for Education projects in developing countries based on impact evaluation. Ng'ambi and Brown (2004) describes a utilisation-focussed evaluation of ICT in education. A formative assessment of ICT in Lebanese Schools was done by way of counting hardware items and measuring ICT indicators (Nasser, 2008), but says nothing about the impact and benefits of those bits of hardware.

2.2 ICT evaluation: ICT4D

Experience across the world shows that success in the application of ICT to address fundamental societal issues in different cultures, different socio-economic conditions and for a range of desired outcomes is extremely variable (Cordell and Romanow, 2005: 20; Pigg and Crank, 2004: 22; Williams, Sligo and Wallace, 2005: 21). Although governments and donor agencies spend vast amounts of money on the deployment of ICT projects in communities we still do not have sufficient insight into methods of evaluating the effectiveness of these ICT projects on socio-economic development.

In the ICT4D arena governments and non-governmental organisations (NGOs) are facing the same problem that the business sector faced over the last thirty to forty years: How to determine if benefits have accrued? It is not a simple task to conceptualize and measure the true value of social development. O'Neill (2002: 77) argued that Community Informatics (CI) project evaluations are scarce because the focus is often on social factors that may be difficult to measure. Parthasarathy and Srivanasan (2006: 3) also warn against applying "easy to measure data for well-defined indicators" to measure social development and social factors.

At a meeting of the group of eight (G8) major industrialized nations of 2002, ICT was formalized as a tool for enabling social and economic development (Rothenberg-Aalami and Pal, 2005). In 2003 the UN General Assembly held the "World Summit on the Information Society" (WSIS) in Geneva. The ICT4D Platform was the outcome of this meeting (Rothenberg-Aalami and Pal, 2005: 4). Since then an increasing number of multi-disciplinary research agencies have been supporting research in the field of ICT4D. However, this growing body of knowledge has been criticised by authors and researchers. Heeks (2007) pointed out that ICT4D outputs: i) reflect a bias to action and not to knowledge, ii) are descriptive, and iii) are not analytical enough. Lee, Jang, Ko and Heeks (2008: 2) found mixed views and evidence about ICT4D outputs. They reported a lack of hard evidence about the economic and social impact on development of ICT4D projects and voiced concern that the impacts are not universally beneficial (Lee et al., 2008: 2).

Parthasarathy and Srinivasan (2006) pointed out that the emergent field of ICT4D has many unclear conceptual issues. In their opinion, an important one is how to evaluate and assess the impact of ICT on developmental outcomes.

The need for an appropriate assessment of benefits derived from ICT4D projects is also supported by other authors. Ashraf, Swatman and Hanisch (2007) found that ICT initiatives in communities have not been as sustainable as expected - these projects ceased when the investing organisations or governments withdrew funds.

However, a number of authors agree that there are still no commonly agreed upon assessment techniques (Merkel, Clitherow, Farooq, Xiao, Ganoe, Carroll and Rosson, 2005; Rothenberg-Aalami and Pal, 2005). Methods vary from longitudinal studies investigating the effects of the Internet on social capital (Gaved and Anderson, 2006) to quantifying performance (of the impact of ICT projects) by way of a system measuring inputs, outputs and outcomes.

In the body of literature dealing with ICT4D project evaluations and measurements, Grunfeld (2007: 7) found that even though there were many initiatives examining different aspects of the information society related to development, there still are gaps in the knowledge relating to benefits of ICT initiatives. Many writers, practitioners and funding organisations have recognised this requirement for further multidimensional research. There are therefore various research opportunities and questions to be asked in the ICT4D domain, of which the evaluation of ICT is one of the most pressing.

2.3 The South African context

The South African government has prioritised economic development policies since the country still has a very inequitable society characterised by a range of developmental levels (Langa, Conradie and Roberts, 2006). The government viewed opportunities presented by the use of ICT as one of the means by which economic growth can be sustained. Progress made in addressing the digital divide in South Africa includes:

- The Information Society and Development (ISAD) plan approved by the cabinet following the adoption of the WSIS agenda;
- The creation of the legislative framework to foster uptake and usage of ICT (e.g. the Electronic Communications Act of 2005 and the Electronic Communications Act of 2002);
- The creation of structures such as the Presidential International Advisory Council (PIAC) or Information Society and Development (ISAD), the e-Skills Council, the Universal Service and Access Agency (USAASA) and a Presidential National Council on Information Society and Development (PNC-ISAD) with a mandate to implement the ISAD plan.

The role of USAASA is to facilitate increased access to ICT to all South Africans. Telecentres that provide ICT services especially in rural and semi-urban areas are being set up by USAASA (Oyedemi, 2009: 159). Non-Government Organisations (NGOs) and Community Based Organisations (CBOs), civil society and the government also own telecentres, and some telecentres are run by small, medium and micro enterprises (SMMEs) (Oyedemi, 2009: 159).

The South African Department of Communications (DoC) and the South African Post Office (SAPO) has launched a project establishing Public Information Terminals (PITs) to provide electronic communication to South Africans (Oyedemi, 2009: 159).

Although understanding how ICT benefit communities and contribute to socio economic development is crucial for the advancement of the ICT4D agenda in South Africa, Theledi (2008) reported to parliament that there is "no mechanism for monitoring and evaluating real impacts of ICT". However, as the preceding discussion reveals, this problem is not a specificity of South Africa. A World Bank study by Batchelor, Evangelista, Hearn, Peirce, Sugden and Webb (2003) confirmed this problem in the developing world at large.

2.4 Evaluation frameworks

O'Neill (2001: 7) reported that several researchers have found that evaluation of ICT4D projects has been limited and ad hoc. Compounding that problem is the fact that there is a variety of experimental frameworks, methodologies, methods and focus in the body of project evaluation work in ICT4D. Examples of these are

- balanced scorecard (Bannister and Remenyi, 2003)
- social network analysis in civil society networks (Garrido, 2004)
- ethnographic studies (Parthasarathy and Srinivasan, 2006: 6)
- Sen's capability approach (Gigler, 2004; Grunfeld, 2007)

Garrido (2004) also presented results of efforts to develop systematic evaluation frameworks for ICT4D in several domains, including ICT and civil society and telecentres. Some of these evaluations used theoretical frameworks and methods that are also used in the evaluation of information systems projects in the business sector. This is supported by Ashraf, Swatman and Hanisch (2007) who argued for existing IS or ICT theoretical paradigms to be extended to create frameworks to evaluate ICT impacts on socio-economic development.

None of these frameworks, however, were developed to effectively evaluate the *benefits* of ICT4D projects. Thus, the objective of this research is to ultimately develop such a framework.

3. Methodology

According to Seddon et al., (1999) evaluations of benefits of ICT projects will be executed differently for different groups of stakeholders. For this reason it is necessary to define the stakeholder group for whom this evaluation study will be done, to be the funding organisations of the ICT4D projects. In this study the funding organisations include national and local government departments or agencies.

The research question that this study will investigate is:

- How can the benefits of public access ICT4D projects be effectively evaluated to determine their impact on local communities?

Sub-questions include

- What theories and frameworks have been used in the evaluation of ICT4D projects?

- What are the factors influencing evaluation of benefits of ICT4D projects?
- What are the indicators of benefits of ICT4D projects?
- How can these factors and indicators be optimized to produce a framework for evaluation and monitoring of benefits of ICT4D projects?

In the 20th century Information Systems research was dominated by the paradigm of positivism where the belief is that a reality independent of the human mind exists and an inquiry process excludes biasing factors (Wyssusek, Schwartz and Kremberg, 2002). Positivism is associated with quantitative research. However, positivism is criticised as being

> *"ignorant towards the subjectivity of human efforts" (Wyssusek et al., 2002)*

On the other hand, interpretive studies, which is associated with qualitative research, attempt to understand phenomena through the meanings that people assign to them (Walsham, 1995).

Over the past twenty years research in Information Systems has broadened to also embrace the interpretive paradigm.

Research towards a framework for the evaluation of benefits of ICT in communities are fairly scarce, and O'Neill (2002: 88) posits that it could be because such an evaluation would have to include assessment of social factors that are difficult to quantify and measure. The author also suggested, in her review of methodological approaches to evaluating community informatics, that multi-modal tools, i.e. a combination of quantitative and qualitative methods, should be used for evaluating projects and programs so as to reach valid findings.

This is supported by Babbie (2007: 387) who describes evaluation research as "*a form of applied research that studies the effects of social interventions*" and both qualitative and quantitative methods of data collection can be used in this kind of research study (Babbie, 2007: 387).

Traditionally researchers of the quantitative research paradigm strived to maintain objectivity in the research inquiry of social research (Johnson and Onwuegbuzie, 2004: 14), whereas the researchers of the qualitative research paradigm contended that research is value-bound and that time- and context-free generalizations are not desirable. Mixed methods research draws from the strengths of both quantitative and qualitative research paradigms (Johnson and Onwuegbuzie, 2004: 15). Johnson and Onwuegbuzie (2004: 17) define mixed methods research as *"the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study*". The strength of both methodologies can be incorporated into a research project when quantitative and qualitative techniques are utilized within the same framework of research (Onwuegbuzie and Leech, 2005: 385). The research design for this study will therefore include a mixed methods research design.

A case study as research method is known for its ability to "merge" the use of both quantitative and qualitative paradigms. This method is used when an explanation about some current social phenomenon is sought or when there is "a desire to understand complex social phenomena" (Yin, 2009: 3). According to Babbie (2007: 309) in a case study the attention is focussed on a single entity, but this method also allows for multiple case studies. Yin (2009: 63) states that mixed methods design enables researchers to investigate more complex research questions. He adds that data collected for these designs can be stronger and richer than can be collected by one method alone.

This research will include case studies of two projects in communities. These are:

- A new public telecentre launched during March this year by Cape Access in Gugulethu, Cape Town
- A community centre run by USAASA

It would also be necessary to do a forward-looking longitudinal study within the two cases to establish a framework of benefits of ICT projects. Longitudinal studies include the gathering of evidence more than once over a period of time (Cooper and Schindler, 2003) in order to investigate patterns or changes over time.

The application of the selected research method will follow the steps:

- Meet the gatekeepers and local community where the telecentre is situated
- Determine the stakeholders of the telecentre.
- Conduct a baseline study by doing interviews with stakeholders
- Monitor the telecentre project over a period of twelve months, doing regular interviews with stakeholders.
- Analyse evidence of interviews to determine possible benefits
- Analyse benefits to produce a comprehensive framework of benefits
- Determine a stakeholder matrix, and conduct a survey amongst stakeholders, so as to establish an evaluation framework
- Test the evaluation framework at a third telecentre (a third case study)
- Review the framework based on findings from the third case study and develop guidelines for implementation of the framework for evaluation of ICT4D projects

Data collected from interviews will be analysed using content analysis. Analytical strategies for data collected from case studies described by Yin (2009: 127) will be employed in the analysis of the qualitative data. The quantitative data collected from the survey will be described using descriptive statistics and analysed using multivariate analysis techniques.

4. Conclusion

This paper proposed a research methodology to address the important and relevant question of how to conduct an appropriate evaluation to determine benefits of ICT4D projects. An overview of relevant literature on evaluation methods and paradigms was presented. The paper also motivated the choice of mixed method research design using multiple case studies to develop an evaluation framework and guidelines for the implementation of such a framework.

Project teams or sponsors/donors of ICT4D projects who find it difficult to rationalize their expenditure will be able to use this proposed framework to evaluate the benefits of ICT4D projects in communities. The existence of such a framework may also add to the theoretical bases that can inform practical ways to determine whether communities (individually and collectively) have developed socio-economically by the means of ICT4D projects. With the inclusion of such a framework in the planning and implementation phase of ICT4D projects the socio-economic development of disenfranchised communities may be realised.

References

Alampay, E. A. 2006. Beyond access to ICTs: Measuring capabilities in the information society. *International Journal of Education and Development using ICT,* 2.

Ashraf, M. M., Swatman, P. & Hanisch, J. 2007. Some perspectives on understanding the adoption and implementation of ICT interventions in developing countries. *The Journal of Community Informatics* [Online], 3. Available: http://www.ci-journal.net/index.php/ciej/article/viewArticle/297/387 [Accessed 31 March 2009].

Babbie, E. 2007. *The practice of social research,* Belmont, CA, Wadsworth, Cengage Learning.

Baliamoune-Lutz, M. 2003. An analysis of the determinants and effects of ICT diffusion in developing countries. *Information Technology for development,* 10**,** 151-169.

Bannister, F. & Remenyi, D. 2003. The Societal Value of ICT: First Steps Towards an Evaluation Framework. *Electronic Journal of Information Systems Evaluation,* 6**,** 197-206.

Batchelor, S., Evangelista, S., Hearn, S., Peirce, M., Sugden, S. & Webb, M. 2003. *ICT for Development: Contributing to the Millennium Development Goals - Lessons Learned from Seventeen infoDev Projects*, World Bank: Washington.

Boyd, D. F. & Carson, H. H. J. 1963. Economic evaluation of management information systems. *IBM Systems Journal,* 2**,** 2-23.

Castells, M. 1999. Information technology, globalization and social development. *UNRISD Discussion Papers 114.* Geneva: United Nations Research Institute for Social Development.

Colle, R. D. 2005. Memo to telecentre planners. *The Electronic Journal of Information Systems Evaluation,* 21**,** 1-13.

Cooper, D. R. & Schindler, P. S. 2003. *Business Research Methods,* New York, McGraw-Hill.

Cordell, A. & Romanow, P. A. 2005. Community networking and public benefits. *Journal of Community Informatics,,* 2**,** 6-20.

Delone, W. H. & Mclean, E. R. 1992. Information systems success: The quest for the dependent variable. *Information Systems Research,* 3**,** 66-95.

Delone, W. H. & Mclean, E. R. 2002. Information Systems Success Revisited. *In: Proceedings of the 35th Hawaii International Conference on System Sciences*, Hawaii. 1-10.
Erwin, G. & Taylor, W. 2004. Assimilation by communities of Internet Technologies. *In:* Marshall, S., Taylor, W. & Yu, X. (eds.) *Encyclopedia of developing regional communities with Infomation and Communication Technology.* Hershey, PA, USA: Idea Group Publishing.
Gallagher, C. A. 1974. Perceptions of the value of a management information system. *Academy of Management Journal,* 17**,** 46-55.
Garrido, M. 2004. A comparative analysis of ICT for development evaluation frameworks. Seattle, WA: Univeristy of Washington.
Gaved, M. & Anderson, B. 2006. The impact of local ICT initiatives on social capital and quality of life. Institute for Sociotechnical Innovation and Research at the University of Essex.
Gigler, B.-S. 2004. Including the Excluded- Can ICTs empower poor communities? Towards an alternative evaluation framework based on the capability approach. *In: 4th International Conference on the Capability Approach*, University of Pavia, Italy. 5-7 September 2004.
Grunfeld, H. 2007. Framework for evaluating contributions of ICT to capabilities, empowerment and sustainability in disadvantaged communities. *In:* Iqbal, T., ed. *CPRsouth2 Conference, Chennai, India – December 15-17, 2007*
Empowering rural communities through ICT policy and research, Chennai, India.
Heeks, R. 2005. ICTs and the MDGs: On the Wrong Track? United Kingdom: University of Manchester.
Heeks, R. 2007. Theorizing ICT4D Research. *Information Technologies and International Development,* 3**,** 1-4.
Irani, Z., Love, P. E. D. & Zairi, M. 2000. Information Systems Evaluation: mini-track introduction. *In:* Chung, M., ed. *Proceedings of the 6th Americas Conference on Information Systems*, Long beach, CA. 10-13 August. Long Beach, CA: California State University, 1073-1075.
ITU 2007. ICT Indicators. *Market Information and Statistics (STAT).* International Telecommunication Union.
Johnson, R. B. & Onwuegbuzie, A. J. 2004. Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher,* 33**,** 14-26.
Joshi, K. & Pant, S. 2002. A classification framework to assess and guide IT investments. *In:* Chang, H. & Kao, Y.-C., eds. *Proceedings of the 8th Americas Conference on Information Systems*, Dallas, Texas. 9-11 August 2000. Atlanta, GA: AIS, 1239-1243.
Langa, Z., Conradie, P. & Roberts, B. 2006. Slipping through the net: digital and other communication divides within South Africa. *In:* Pillay, U., Roberts, B. & Rule, S. (eds.) *South African Social Attitudes: Changing Times, Diverse Voices.* Cape Town: HSRC Press.
Lee, H., Jang, S., Ko, K. & Heeks, R. 2008. Analysing South Korea's ICT for Development Aid Programme. *The Electronic Journal on Information Systems in Developing Countries* [Online], 35. Available: http://www.ejisdc.org/ojs2/index.php/ejisdc/article/view/496/252.
Lucas, H. C. 1973. User reactions and the management of information services. *Management Informatics,* 2**,** 165-172.
Merkel, C. B., Clitherow, M., Farooq, U., Xiao, L., Ganoe, C. H., Carroll, J. M. & Rosson, M. B. 2005. Sustaining Computer Use and Learning in Community Computing Contexts: Making Technology Part of "Who They are and What They Do". *The Journal of Community Informatics,* 1**,** 158-174.
Milis, K. & Mercken, R. 2004. The use of the balanced scorecard for the evaluation of Information and Communication Technology projects. *International Journal of Project Management,* 22**,** 87–97.
Nasser, R. N. 2008. A formative assessment of information communication technology in Lebanese schools. *Journal of Education and Development using ICT* [Online], 4. Available: http://ijedict.dec.uwi.edu/viewarticle.php?id=492&layout=html [Accessed 25 october 2008].
Ng'ambi, D. & Brown, I. 2004. Utilisation-Focused Evaluation of ICT in Education: The Case of DFAQ Consultation Space. *Educational Technology & Society,* 7**,** 38-49.
O'Neil, D. 2001. Merging Theory with Practice: Toward an Evaluation Framework for Community Informatics. *In: Internet Research 2.0: INTERconnections: The Second International Conference of the Association of Internet Researchers*, University of Minnesota, Minneapolis-St.Paul Minnesota, USA.
O'Neil, D. 2002. Assessing community informatics: a review of methodological approaches for evaluating community networks and community technology centers
Internet Research: Electronic Networking Applications and Policy, 12**,** 76-102.
Onwuegbuzie, A. J. & Leech, N. L. 2005. On Becoming a Pragmatic Researcher: The Importance of Combining Quantitative and Qualitative Research Methodologies. *International Journal of Social Research Methodology,* 8**,** 375-387.
Oyedemi, T. D. 2009. Social Inequalities and the South African ICT Access Policy Agendas. *International Journal of Communication,* 3**,** 151-168.
Parthasarathy, B. & Srinivasan, J. 2006. Innovation and its Social Impacts: The Role of Ethnography in the Evaluation and Assessment of ICTD Projects. *In: Global Network for Economics of Learning Innovation, and Competence Building Systems Conference*, Tivandrum, India, 4-7 October.
Pigg, K. E. & Crank, L. D. 2004. Building community social capital: The potential and promise of information and communications technologies. *The Journal of Community Informatics,* 1.
Rothenberg-Aalami, J. & Pal, J. 2005. Rural Telecenter Impact Assessments and the Political Economy of ICT for Development (ICT4D). Berkley: BRIE Working Paper 164.
Seddon, P. B., Staples, S., Patnayakuni, R. & Bowtell, M. 1999. Dimensions of information systems success. *Communications of the AIS,* 2.

Sen, A. 1999. *Development as Freedom*, London: Oxford University Press.
Theledi, J. 2008. Presentation made by CEO of USAASA to the South African Parliamentary Portfolio Committee on Communications, 18 March 2009.
UNESCO. 2002. *Reaching the Millennium Development Goals: an overview of the current process and its implications for UNESCO* [Online]. United Nations. Available: http://www.unesco.org/bsp/eng/mdg.htm [Accessed 19 October 2009].
Van Rensburg, J., Veldsman, A. & Jenkins, M. 2008. From Technologists to Social Enterprise Developers: Our Journey as "ICT for Development" Practitioners in Southern Africa. *Information Technology for development,* 14**,** 76-89.
Wagner, D. A., Day, B., James, T., Kozma, R. B., Miller, J. & Unwin, T. 2005. *Monitoring and evaluation of ICT in education projects: A Handbook for Developing Countries,* Washington, DC, infoDev / World Bank.
Walsham, G. 1995. The emergence of interpretivism in IS research. *Information Systems Research,* 6**,** 376.
Williams, J., Sligo, F. & Wallace, C. 2005. Free internet as an agent of community transformation. *The Journal of Community Informatics,* 2**,** 53-67.
World Bank. 2009. *Information and Communications for Development - Extending Reach and Increasing Impact.* Washington DC: The International Bank for Reconstruction and Development / The World Bank
WSIS. 2003. *World Summit on the Information Society (WSIS)* [Online]. [Accessed 12 December].
Wyssusek, B., Schwartz, M. & Kremberg, B. 2002. Targeting the social: A sociopragmatic approach towards design and use of Information Sytems. *In:* Khosrow-Pour, M., ed. *Information Resources Management Association*, Seattle, USA: IGI Publishing, 832-835.
Yin, R. K. 2009. *Case Study Research Design and Methods,* California, Sage Inc.